

### **REMARKS**

Claims 1-7 and 10-47 remain in the application. Claim 1 has been amended herein to include the limitation of former dependent claim 13, which has now been cancelled along with previously withdrawn claims 25-47. Therefore, no new issues or new matter are presented in the amendments. Applicants submit the present amendments and remarks, and respectfully request reconsideration and allowance of the remaining claims 1-7, 10-12 and 14-24.

#### ***I. Rejections Under 35 U.S.C. § 103(a)***

The Examiner rejected claims 1-7, 10-16 and 19-24 under 35 U.S.C. §103(a) as being unpatentable over *Jagannadh et al.* (U.S. Patent No. 5,238,538). The Examiner alleged that the *Jagannadh* reference teaches applying a direct current electric field to a decontamination cell, and that utilization of voltages in the 800 to 6,000 volt range in the present invention was mere optimization. The Examiner also rejected claims 17 and 18 under 35 U.S.C. §103(a) as being unpatentable over *Jagannadh, et al.* as applied to claim 1 above, and further in view of Lawson, (U.S. Patent No. 5,733,413) or Lawson et al. (U.S. Patent No. 6,139, 684) or Markham (U.S. Patent No. 5,580,446). Applicants respectfully traverse these rejections as follows.

Applicants have amended the claims to further clarify the present invention. Applicants' invention as presently amended is directed to a method of decontaminating a fluid comprising applying a high voltage electric field across a fluid having contaminants dispersed therein by flowing the fluid between an anode and a cathode of an electro-potential cell; wherein the anode comprises an elongated rod which tapers to a point in the direction of the cathode, and wherein the electric-potential is between about 800 and about 6000 volts per inch between the anode and cathode and flowing the fluid through a decontamination cell to separate from the fluid at least a portion of the contaminants.

In support of the presently pending claims, Applicants provide herewith the separate Declarations of Dr. Jeffrey S. Hsieh and Dr. Mahendra R. Doshi under 37 CFR §1.132. As described by inventor Dr. Hsieh, in order to provide the greatly increased voltage used in the presently claimed invention, modifications to the electrodes were necessary wherein the anode

comprises an elongated rod which tapers to a point in the direction of the cathode. With the present invention, only a very small current is required to generate the large voltage, which provided the unexpected benefits described below and also has provided energy saving benefits for this new industrial process.

The Specification describes on page 16, line 6-25, the tapering of the anode in the direction of the cathode, and further page 18, lines 1-10 describe the surprising efficiencies achieved thereby.

“Important to the commercial feasibility of the methods and devices, it was discovered that the geometric relationship between the cathode and the anode is critical to both power consumption and maintenance-free (or low maintenance) operation of the electropotential cell. Preferably, the high-voltage, low power electropotential cell of the present invention provides a minimum anode surface area to reduce power consumption. It was discovered that this minimum anode surface could be achieved by orienting the anode towards the cathode such that the anode is tapered in the direction of the cathode, by terminating the anode in a sharp point to reduce power consumption and reduce insulating build-up...”.

The Declarations of Dr. Jeffrey S. Hsieh and Dr. Mahendra R. Doshi under 37 CFR §1.132 are provided to attest to the non-obviousness of the presently claimed invention. Both Declarants recognize that the *Jagannadh* patent reference does not teach or suggest the presently claimed invention. The *Jagannadh* reference discloses the use of an electric field to induce “electrolysis of water and other liquids in the pulp slurry, creating gas bubbles which cause flotation and bleaching.” (*Jagannadh* column 6, lines 24-26). Nowhere does the *Jagannadh* reference teach a specific voltage range. In order to achieve the gas bubbles taught in the *Jagannadh* reference, it would not be necessary or desirable to use a voltage above 800 volts, or specifically about 800 and about 6,000 volts per inch, between the anode and cathode, wherein the anode comprises an elongated rod which tapers to a point in the direction of the cathode.

According to the Declaration of Dr. Hsieh, electric fields of greater than 800 volts per inch were not used or intended in the *Jagannadh* patent description for electrolytic flotation, nor even possible with the equipment that was actually used at that time.

The novelty of the presently claimed invention does not lie with simply applying a low electric voltage to paper slurry to achieve electrolysis and air bubbles, which was known at the time, but rather to a greatly increased voltage which provides improvement in separation of contaminants, such as flexographic ink and microstickies, in a fluid such as an aqueous slurry of paper fibers. Applicants have discovered that a voltage of 800 to 6,000 volts per inch between the anode and the cathode, wherein the anode comprises an elongated rod which tapers to a point in the direction of the cathode, affords the many improvements described. The Examples show that voltages within this range improve the decontamination of biologics (Example 1), wax from corrugated cardboard (Example 2), improve fiber strength (Examples 3 and 4), removal of flexographic ink, (Example 5), microstickies (Example 6) and fiber reclamation (Example 7). Some of these advantages were not contemplated in the *Jagannadh* patent, in part because some of those contaminants, e.g. microstickies and flexographic inks, were not even in common usage at the time of the *Jagannadh* patent.

Moreover, the invention also provides improved electrode cleaning during decontamination at a voltages above 800 volts per inch between the anode and the cathode, wherein the anode comprises an elongated rod which tapers to a point in the direction of the cathode. (Specification page 14, lines 20-28). In particular, "the electro-potential cell is specifically designed to apply a voltage to a liquid as it flows through the device, while maintaining continuous electrode cleaning during operation." (Specification page 15, lines 16-19). However, the *Jagannadh* reference describes that a cleaning brush, or other electrode cleaning means, must be used to dislodge ink particles from the cathode. (*Jagannadh* column 10, lines 39-64). The *Jagannadh* reference applies a low voltage electric current for the creation of gas bubbles to simulate a flotation process for de-inking without any consideration to the high voltage necessary to improve the electrode cleaning during de-inking.

There is no teaching or suggestion in the *Jagannadh* reference that higher voltages can be used to achieve the improvements of fluid decontamination, fiber strengthening, reclamation and electrode cleaning described herein, and therefore it must be assumed that no higher voltages (e.g., 800 to 6,000 volts per inch), or tapering of the electrode, were ever used or suggested as being useful for obtaining these very desirable properties. Importantly, the co-inventor of both applications, Dr. Jeffrey Hsieh has declared that voltages at or above 800 volts per inch were not

used or intended to be used in the *Jagannadh* patent description for simple electrolytic flotation, nor even possible with the equipment that was actually used at that time. Because the *Jagannadh* reference has failed to teach each and every single aspect of the presently claimed invention, and because the modification of voltage and electrode shape were not merely routine in achieving the unexpected results described, Applicants respectfully request withdrawal of this rejection.

In summary, the subject matter of the present invention as amended is neither disclosed nor rendered obvious by any of the cited documents or by any combination of the documents if the skilled person would have combined them at all. Rather, the combination of the documents as suggested by the Examiner represents an inadmissible hindsight approach knowing the subject matter of the present invention. Therefore, Applicants respectfully request withdrawal of the prior art rejections and allowance of the claims.

### **III. Conclusion**

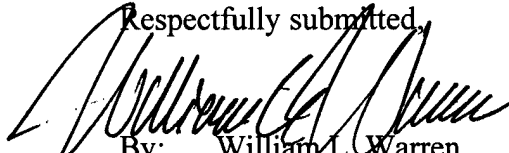
The foregoing is submitted as a full and complete response to the Final Office Action mailed May 10, 2005. In view of the present amendment and response to Office Action, Applicants respectfully request that a timely Notice of Allowance be issued in this case.

The Examiner is encouraged to call the undersigned attorney at 404-853-8081 if doing so will facilitate prosecution of the application. A Notice of Appeal is filed herewith. A request for a one-month extension of time is also enclosed. It is not believed that extensions of time or fees for net addition of claims are required beyond those that may otherwise be provided for in documents accompanying this paper. However, if additional extensions of time are necessary to

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prevent abandonment of this application, then such extensions of time are hereby petitioned under 37 C.F.R. § 1.136(a), and any fees required therefore (including fees for net addition of claims) are hereby authorized to be charged to our Deposit Account No. 19-5029.

Respectfully submitted,



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